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OPERATIONAL ACCEPTANCE TEST (OAT) PLAN

For
*Automated Surface Observing System
(ASOS)*

Software Version 2.82

March 2006

**U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service
Office of Operational Systems
Field Systems Operations Center
Test and Evaluation Branch**

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Acronyms

ACCB	ASOS Configuration Control Board
ACE-IDS	ASOS Controller Equipment – Information Display System
ACU	Acquisition Control Unit
ADAS	AWOS/ASOS Data Acquisition System
ALDARS	Automated Lightning Detection and Reporting System
AOMC	ASOS Operations and Monitoring Center
ASOS	Automated Surface Observing System
ATIS	Automatic Terminal Information System
AWIPS	Advanced Weather Interactive Processing System
AWPAG	All-Weather Precipitation Accumulation Gauge
CD	Compact Disc
DCP	Data Collection Platform
ESA	Electronics System Analyst
ET	electronics technician
FAA	Federal Aviation Administration
FAATC	FAA Technical Center
FMK	Field Modification Kit
GTA	Ground-to-Air
HTB	Heated Tipping Bucket Rain Gauge
IFW	Ice-Free Wind
METAR	Aviation Routine Weather Report
Mod Note	NWS Engineering Modification Note
NCDC	National Climatic Data Center
NGRVR	New Generation Runway Visual Range
NWS	National Weather Service
OAT	Operational Acceptance Test
OID	Operator Interface Device
PAMS	Product Availability Monitoring System
PPI	Planned Product Improvement
PT	Part Time
RC	Request for Change
RVR	Runway Visual Range
SCA	Single Cabinet ASOS
SHEF	Standard Hydrologic Exchange Format
SPECI	Aviation Selected Special Weather Report
ST	System Test
TRG	Test Review Group
TTR	Test Trouble Report
V	Version
WSH	NWS Headquarters
WSP	Weather Systems Processor

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Part I: Overview

1. Introduction

The National Weather Service (NWS) has nearly completed deployment of an Acquisition Control Unit (ACU) processor upgrade for the Automated Surface Observing Systems (ASOS), replacing the original ASOS Xycom processors with Synergy Microsystems processors. The Synergy processors provide the increased processing capability needed to incorporate approved requests for change (enhancements) in future software versions and to support the ASOS Planned Product Improvement components:

- o replacement dewpoint sensor (DTS1),
- o All-Weather Precipitation Accumulation Gauge (AWPAG),
- o Ice-Free Wind (IFW) sensor,
- o enhanced precipitation identifier, and
- o ceilometer replacement.

The Synergy processors have been approved for installation at virtually all ASOS sites and are currently operating with five different software versions (based on site configuration and operational requirements):

V2.7B-6 (08/15/03) supports the DTS1, the original (limited production) IFW sensor, the AWPAG, and the Federal Aviation Administration (FAA) ASOS Controller Equipment – Information Display System (ACE-IDS)

V2.79 (07/22/04) supports the DTS1, (revised production) IFW sensor, the AWPAG, and the FAA’s Weather Systems Processor (WSP) interface – but not ACE-IDS.

V2.79 (08/02/04) adds wind gust diagnostics and quality control. This software was approved for installation only at sites which have experienced unrepresentative wind gusts with the Belfort wind sensor. The diagnostics and quality control are not included in subsequent software versions.

V2.79A (03/22/05) supports the DTS1, (revised production) IFW sensor, AWPAG, WSP, and ACE-IDS. This version also incorporates a fix for the observer password corruption problem noted at sites with backup ceilometers.

V2.79B (09/19/05) is identical to V2.79A except for addition of a fix for an ACU spontaneous coldstart problem (noted in all previous versions), a fix for some warmstarts, and elimination of the IFW diagnostic “path error” messages from the SYSLOG. V2.79B was approved for general deployment on February 3, 2006.

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OATs have been completed for the DTS1, AWPAG, and IFW sensors, in conjunction with appropriate software versions. Deployment of these sensors is now under way.

V2.80 (12/03/04), which was based on V2.79, added 35 new capabilities and nine fixes for problems noted in previous versions.

V2.82 (10/27/05) incorporates additional changes as follows:

Fix for an ASOS clock problem noted at sites with ACE-IDS Interfaces – initially in V2.80 (03/16/05).

Fixes for sites with remote pressure sensors and for an ACE-IDS data update problem – initially in V2.80 (06/16/05).

Three changes for Air Force sites: Handar ceilometer support, display of visibility in meters for overseas sites, and display of 5-sec winds on the Video Display Unit. This functionality will only be used at Air Force sites – initially in V2.82 (10/16/05).

Fix for missing altimeter data in Single Cabinet ASOSs (SCA) – initially in V2.82 (10/27/05).

V2.82 (01/17/06), the subject of this OAT, includes all capabilities of previous versions and adds fixes for:

premature transmission of Aviation Routine Weather Reports (METAR) when the observer “forces” an Aviation Selected Special Weather Report (SPECI) during the METAR edit window,

lack of audio alarms for “HOURLY PENDING”, and

lack of an error message for entry of dewpoint without temperature.

The V2.82 Release Note (Attachment 4) describes the V2.80 and V2.82 changes in detail. Three of the new capabilities (described in Table 1 of the Release Note) are of particular interest:

Adaptive Baseline Frequency for the Freezing Rain Sensor (# 24)

Some freezing rain sensors have a resting frequency lower than the design value of 40,000 hertz. This change will allow ASOS to determine a dynamic resting baseline frequency for the installed freezing rain sensor at the site.

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Validation of Precipitation Accumulation (# 28)

Sometimes referred to as “The False Tip Algorithm”, this is an effort to remove the false reporting of precipitation from dew, fog, or anything else that might fall into the Heated Tipping Bucket (HTB) or the AWPAG when precipitation is not occurring.

Ice Accretion Remark (# 31)

The amount of ice accreting on a flat surface (planar icing) as estimated by the data from the freezing rain sensor, will be included in the remarks section of METARs / SPECIs.

2. OAT Purpose

ASOS observations and products must effectively support both NWS forecast/warning operations and Federal Aviation Administration (FAA) aviation operations. The OAT is designed to confirm satisfactory ASOS performance at representative field sites with V2.82 installed. Before the operational deployment of the V2.82 software can be recommended, the OAT must verify the acceptability and/or performance of the following:

- o Installation procedures
- o Documentation
- o Interfaces with both NWS and non-NWS systems
- o Operational stability and availability
- o Operator interfaces
- o Production, transmission, and archiving of observations/products
- o Logistics and maintenance

3. Background

3.1 System Description

Using data from an array of sensors, information from interfaces with other NWS or FAA systems, and observer input, ASOS formulates and transmits METAR and SPECI observations; Standard Hydrologic Exchange Format (SHEF) reports; and other products. With V2.82 software installed, ASOS supports the DTS1 dewpoint sensor, the Vaisala 425 IFW sensor, and the AWPAG, as well as the WSP, and ACE-IDS interfaces.

3.2 Test History

The Test and Evaluation Branch (OPS24) has successfully completed a System Test (ST) for V2.82 using non-commissioned test ASOSs - **SP1**, a single Data Collection Platform (DCP) test ASOS at NWS Headquarters (WSH) in Silver Spring, Maryland; **1S2**, an SCA at WSH; and

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ST0, a three DCP test ASOS at the Sterling, Virginia, NWS test facility. The ST began on April 7, 2005, with V2.80 (03/16/05) and was suspended on April 21, 2005, as a result of ACE-IDS interface problems. The ST was resumed on October 24, 2005, with V2.82 (10/18/05) and suspended on November 1, 2005, when problems were encountered during Factory Acceptance Testing at an Air Force site. The ST was resumed on November 7, 2005, with V2.82 (10/27/05) and was suspended on December 7, 2005, when four problems were found and documented. The ST was resumed on January 27, 2006, with V2.82 (01/17/06) and completed on February 15, 2006. During the ST, test procedures were run to confirm the functionality and stability of the software. Problems documented in two TTRs written against previous software versions (V2.79A and V2.79B) have not been fully addressed in V2.82 and have been assigned to Prism for investigation. Since these problems affect only staffed sites and sites with IFW sensors, the initial phase of the OAT will be limited to unstaffed sites without IFW sensors. These sites are highlighted in Attachment 1. Once these two problems have been fixed and verified in an ST, the revised software will be installed in the operational ASOS at Atlantic City (ACY), NJ, and the FAA Technical Center will evaluate performance of the FAA interfaces (ADS/ALDRS, ACE-IDS, WSP, etc.). If performance of the FAA interfaces is satisfactory, the software will be released to the remaining sites for OAT evaluation.

4. OAT Objectives

The OAT must confirm the following at field sites:

- o The installation procedures for V2.82 are correctly described in the documentation provided to the electronics technician (ET) responsible for software installation.
- o User documentation (the Draft Release Note) is sufficient and accurate.
- o ASOS interfaces properly with both NWS and non-NWS systems
- o The stability of ASOSs with V2.82 software is satisfactory.
- o All operator interfaces function properly.
- o ASOSs operating with V2.82 software produce/transmit satisfactory observations/products.
- o Logistics and maintenance support is available and satisfactory.

More detailed evaluation criteria are provided in Part II, Section 4.1.

At the completion of the evaluation, the OAT Director will provide results and a Test Review Group (TRG) implementation recommendation to the ASOS Configuration Control Board (ACCB) Chair.

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5. OAT Policies

The ASOSs at the OAT sites are operational and provide products (METARs, SPECIs, SHEF reports, etc.) which are critical to both NWS forecast/warning operations and FAA aviation operations. At any time during the OAT, if the test site Focal Point judges ASOS performance to be unacceptable, he/she is authorized to have the ET re-install the previous software version to ensure satisfactory support of NWS and FAA operations.

5.1 Assumptions and Limitations

Sites with a wide variety of system configurations and operational scenarios were selected for participation in the OAT. There may, however, be some unusual configurations and/or scenarios which are not represented. The NWS/FAA OAT will not evaluate the Air Force changes. A separate evaluation is being performed by the Air Force at Air Force sites.

The OAT is designed to confirm the overall performance of ASOS with V2.82 software installed. It is not intended as a definitive evaluation of ASOS sensor performance. Although the OAT sites are distributed throughout the United States and are expected to experience a wide variety of weather conditions during the evaluation period, some phenomena may not occur at any of the sites. Sensor performance was confirmed during qualification and environmental testing.

Since the ASOSs participating in the OAT are operational, observers are not being asked to perform any actions (augmentation, edit, etc.) other than those required by their routine operations. As a result, some observer actions may not be exercised during the OAT. To the extent possible, however, all observer actions were exercised during the ST.

5.2 Software Installation

The NWS ET who normally maintains the ASOS will install V2.82 software using instructions provided by the Maintenance Branch (OPS12). Installation is not to occur at an FAA-staffed or FAA contract-staffed ASOS without agreement by the local FAA management to have the observers provide manual backup for METARs/SPECIs during the period when ASOS cannot generate and disseminate an automated METAR/SPECI. Since OID displays are revised with V2.82, notification and training will be required at least 30 days prior to installation for sites with FAA or FAA contract observers. The training and coordination is being performed by the FAA.

5.3 Prerequisites and OAT Commencement

Satisfactory completion of the ST is a prerequisite to commence the OAT and the OAT will commence with the first installation of V2.82 at an OAT site.

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5.4 System Operation

All test site ASOSs are commissioned and will continue to provide official observations/products throughout the evaluation period. No changes in station operations are required. The only added workload is the documentation and reporting of any problems encountered.

5.5 System Support

The standard maintenance policy will apply at the OAT sites with one exception. If the site Focal Point judges ASOS performance to be unacceptable and believes V2.82 may be the cause, he/she is authorized to have the ET re-install the previous software version to ensure continued support of NWS and FAA operations.

6. OAT Management

The field/operational aspects of the OAT will be managed by OPS24. The OAT Director is:

Bryan Moore W/OPS24	Phone	301-713-0326 x176
National Weather Service - Station 4384	Fax	301-713-0912
1325 East-West Highway	email	Bryan.Moore@noaa.gov
Silver Spring, MD 20910		

The OAT TRG, made up of representatives from:

OS7	Observing Services Division
OS32	Hydrologic Services Division Support Branch
OST32	Development Branch
OPS12	Maintenance Branch
OPS22	Observing Systems Branch
CIO12	Telecommunication Gateway Operations Branch
ERH	Eastern Region Headquarters
CRH	Central Region Headquarters
SRH	Southern Region Headquarters
WRH	Western Region Headquarters
ARH	Alaska Region Headquarters
PRH	Pacific Region Headquarters
FAAHQ	FAA Terminal Services

will participate in periodic conference calls and provide guidance for major decisions during the OAT.

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6.1 Weather Service Headquarters (WSH) Roles and Responsibilities

OPS24 is responsible for preparation and distribution of the OAT plan; advance and day-to-day coordination of test activities; conduct of periodic conference calls; and preparation of a report which documents results and presents recommendations.

OPS12 is responsible for providing software to the Electronics System Analyst (ESA) or ET responsible for each test site. Software will be available on the ASOS technician web site, the OPS12 ftp site or, if necessary, be provided on compact disc (CD). OPS12 will also make the draft NWS Engineering Modification Note (Mod Note) available to the ETs. OPS22 has provided the draft V2.82 Release Note (Attachment 4).

OS7, OS32, OST32, OPS12, OPS22, and OPS33 are responsible for participating in the conference calls and for the evaluation of any performance problems encountered during the OAT.

6.2 Regional Headquarters Roles and Responsibilities

Regional ASOS Focal Points are responsible for ensuring regional and test site staff are prepared to conduct the OAT, for resolving day-to-day operational problems related to the OAT, and for participating in the OAT conference calls.

6.3 Test Site Focal Point Roles and Responsibilities

Test site Focal Points are responsible for coordinating site performance monitoring, for documenting problems on Test Trouble Report (TTR) forms (Attachment 3), and for reporting problems/results to the OAT Director. Test site Focal Points need only participate in the TRG conference calls if requested to do so by the respective Regional Focal Point.

6.4 OAT Review Process

Any ASOS operational problems will be reported (by phone or email) to the OAT Director upon occurrence and documented on TTR forms (Attachment 3). Fax or email are to be used to submit TTR forms to the OAT Director. Each TTR will be forwarded to the TRG members for review and discussion at the next TRG conference call.

At the conclusion of the evaluation period, the OAT Director will review the performance of V2.82 with the TRG in order to formulate an implementation recommendation. The OAT Director will provide test results and an implementation recommendation to the ACCB Chair at the completion of the OAT.

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Part II: Methodology

1. Introduction and Approach

During the OAT, V2.82 software will be installed at 33 commissioned field sites and ASOS performance will be evaluated for a period of approximately eight weeks by on-site or nearby field staff. The results of the evaluation will form the basis for an implementation decision by NWS management. Periodic TRG conference calls will be held with Regional ASOS Focal Points, WSH representatives, and site Focal Points (as required).

2. Critical Operational Issues for Evaluation

To determine the suitability of V2.82 for operational use at commissioned sites, the following must be evaluated:

- o Installation procedures and documentation
- o Interfacing with both NWS and non-NWS systems
- o Software stability
- o Operator interfaces
- o Production and transmission of satisfactory observations and products
- o Logistics and maintenance

3. OAT Sites

OAT sites have been selected to include the following ASOS operational scenarios:

Full-time staffed operations
Part-time staffed operations
Unstaffed operations

and system configurations which include various combinations of the following:

Single DCP configuration
Multiple DCP configuration
SCA system configuration
DCP with three pressure sensors

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Backup sensors (visibility and/or sky)
Meteorological discontinuity sensors (visibility and/or sky)
Backup AND meteorological discontinuity sensors
Single site thunderstorm sensors
Automated Lightning Detection and Reporting System (ALDARS) thunderstorm capability
Freezing rain sensors
DTS1 dewpoint sensors
IFW sensors
AWPAG precipitation sensors
FAA Ground-to-Air (GTA) radio
Automatic Terminal Information System (ATIS)
Advanced Weather Interactive Processing System (AWIPS) communications
AWOS/ASOS Data Acquisition System (ADAS) communications
ACE-IDS interface
WSP interface
New Generation Runway Visual Range (NGRVR) interface

The OAT sites and their characteristics are listed in Attachment 1.

4. OAT Methodology

Testing will consist of performance monitoring during routine operations. No on-site test activities other than the reporting and documenting of ASOS problems are required.

- o The NWS ASOS ET responsible for maintenance of the site will install the V2.82 software using procedures provided by OPS12.
- o The test site Focal Point (identified in Attachment 2) will monitor ASOS performance, review observations as required, confirm (with the FAA) correct WSP, ACE-IDS, and NGRVR performance, report any problems to the OAT Director, and document the problems on TTR forms (Attachment 3) for submission to the OAT Director.
- o The ASOS Operations and Monitoring Center (AOMC) will provide the OAT Director weekly reports listing any cases when test site ASOS observations/products do not arrive at the NWS Telecommunication Gateway as expected.
- o Monthly summary data for one calendar month of operation will be evaluated for several sites.
- o OPS24 will conduct periodic conference telephone calls with the TRG, ASOS Regional Focal Points, and test site Focal Points (as required) to assess the status of the OAT.

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4.1 Evaluation Criteria

Specific criteria for the operational suitability of the V2.82 software are:

- o Installation procedures and documentation - Documentation (draft Mod Note 80D and the draft V2.82 Release Notes) must be clearly written, complete, and easy to follow (subjective evaluation by ETs and test site staff).
- o Interfacing with both NWS and non-NWS systems must be correct (including but not limited to):
 - Incorporation of FAA Runway Visual Range (RVR) or NGRVR information into the ASOS METAR reports
 - Incorporation of thunderstorm information from the FAA's ALDARS system into the ASOS METAR and SPECI reports
 - Correct display of information on the FAA WSP displays
 - Correct display of information on the displays interfaced to the FAA ACE-IDS
 - Correct transmission of information on the GTA radio
 - Correct dissemination of information on the ATIS
- o Stable ASOS operation - The spontaneous system restart (i.e., warm/cold boot) frequency must be consistent with or improved over the site's past history.
- o Operator interfaces – ASOS must respond properly to operator commands.
- o Production, transmission, and archiving of observations/products – Observations must be representative of conditions (within the limitations of the ASOS sensors), correctly formatted, transmitted successfully, and archived in the ASOS data base (evaluation by on-site and/or nearby NWS staff).

4.1.1 Tracking Problems and Deficiencies

The test site Focal Points will report any ASOS problems judged to be software-related to the OAT Director, documenting the problems on TTR forms (provided as Attachment 3). The OAT Director will review the weekly missing observation/product reports provided by the AOMC.

The OAT Director will conduct periodic conference calls (with participation by NWS and FAA national and regional representatives) for the duration of the evaluation. Times and specific

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details will be provided (by email) to participants. When required, Regional Focal Points should invite test site Focal Points to participate in the conference calls to present specific problems encountered at their sites.

4.1.2 Evaluation of Test Results

Each problem reported by site Focal Points will be evaluated by the TRG (consultation with test site Focal Points will take place if necessary) to determine criticality and a suitable course of action.

4.2 Installation

The V2.82 software and draft Mod Note 80D will be posted on the OPS12 ftp site. The ASOS ETs will install the software at their earliest convenience after receiving authorization from OPS12. Any installation problems with the system, Mod Note, software, procedures, etc. are to be reported **immediately** to the regional ASOS Focal Point and the OAT Director.

4.3 Test Conduct

All of the test ASOSs are commissioned and provide the official observations/products for the site. Routine ASOS problems should be reported according to established procedures. If the problem is judged to be software-related, however, it is to be reported immediately to the OAT Director and documented as described in Section 4.3.1. At any time during the OAT, if the test site Focal Point judges ASOS performance to be unacceptable, he/she is authorized to have the ET re-install the previous processor/software to ensure continued support of NWS and FAA operations.

4.3.1 Test Site Actions

During routine operations, ASOS observations will be monitored/reviewed by the test site Focal Point. For any occasions when the ASOS does not operate as expected, the problems should be reported to the OAT Director:

Bryan Moore W/OPS24
Phone 301-713-0326 x176
Fax 301-713-0912
email Bryan.Moore@noaa.gov

Problems should be thoroughly documented on TTR forms (provided as Attachment 3) and faxed or mailed to the OAT Director. Copies of screens and data printouts (ASOS and/or AWIPS, as appropriate) should be included to provide clarification whenever possible.

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4.3.1.1 Procedure: Real-time Monitoring of Observations

Monitor the observations/products as they are generated by ASOS, paying particular attention to any observations containing remarks or additive data (e.g., precipitation amounts, maximum/minimum temperatures, and three-hour pressure changes) and observations generated during periods when failed sensors are being backed up (either by the observer or the backup sensors). For each observation containing remarks or additive data, review the 5-minute observations and the 1-minute data to verify their appropriateness and accuracy. Periodically call the FAA voice phone and verify the observations (including the required remarks) are being voiced properly.

4.3.1.2 Procedure: Review of Observations

Periodically review the observations in the same manner in which an observer would check the observations taken during the previous shift. For example, check temperature, dewpoint, wind shifts, pressure remarks, variable ceilings, and visibilities. Determine whether specials were taken properly. Evaluate the consistency of precipitation and temperature data from hourly data through 3-hour, 6-hour, daily, and monthly data. Specifically:

- o Hourly/Special Observations -- During each shift, review the ASOS METARs and SPECIs from the previous shift.
- o Daily Summaries -- Once per day, review the daily summary page to verify consistency with the additive data appearing in the hourly observations. Note: if the daily summary has been manually edited, agreement cannot be expected.
- o Monthly Summaries -- Periodically review the monthly (to date) page to verify consistency with the daily pages.

4.3.1.3 Procedure: Evaluation of FAA Interfaces

At staffed sites with NGRVR, periodically confirm proper incorporation of RVR in the ASOS METARs and SPECIs. At sites with ADAS/ALDARS, periodically verify proper incorporation of ALDARs thunderstorm information into the ASOS METAR and SPECI reports. Coordinate with local FAA representatives to verify correct performance of NGRVR, ACE-IDS, WSP, ATIS, and GTA radio interfaces.

4.3.2 Regional ASOS Focal Point Actions

The regional ASOS Focal Points are responsible for the resolution of day-to-day operational problems and for participation in the conference calls.

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4.3.3 WSH Actions

The OAT Director will provide/coordinate technical assistance to the regional and site Focal Points as required, chair the conference calls, coordinate the final performance review, provide test results to the PPI Manager at the completion of the OAT, and prepare a final report. During the evaluation period, OPS24 will use the Product Availability Monitoring System (PAMS) to archive OAT site data for analysis.

4.3.4 AOMC Actions

During the evaluation period, the AOMC will confirm the ability to support the test sites. Results of the AOMC evaluation will be provided to the OAT Director by the end of the evaluation period.

4.3.5 National Climatic Data Center (NCDC) Actions

For the test sites, the NCDC will continue to perform the routine downloading of ASOS data (high-resolution, daily summary, and monthly summary) via the high-speed modems and report any problems encountered to the OAT Director.

5. OAT Schedule

The OAT will begin immediately after the conclusion of a successful ST. After one week of satisfactory performance at the first installed OAT site (ACY-Atlantic City, NJ), installation will be approved for the remaining sites. Evaluation will continue until at least eight weeks of experience has been gained at each OAT site.

6. Test Materials

The V2.82 software and Mod Note 80D will be available on the ASOS technician web site. The V2.82 Draft Release Note, TTR forms, and V2.82 OAT Survey are provided as attachments to this plan.

7. Post-Test Activities

Unless a decision to the contrary is made by the TRG, V2.82 will remain installed at the test sites at the conclusion of the evaluation period.

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Part III: Test Reports

1 Introduction

The OAT Director will provide progress reports to all participants during the evaluation period and a final report at the conclusion of the OAT.

2 Conference Calls and Interim Reports

Conference calls with NWS and FAA national and regional representatives will be conducted periodically during the evaluation period. Times and specific details, along with test progress reports, will be provided to participants by email. The site Focal Points will report on evaluation progress and any problems noted.

3 Final OAT Report

The OAT Director will provide the ACCB Chair with a summary of results and an implementation recommendation at the end of the OAT. In addition, the OAT Director will prepare a final OAT report which fully documents evaluation results.

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Attachment 1

V2.82 OAT Sites

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Site

Relevant Site Characteristics

NWS Eastern Region

ACY Atlantic City, NJ
BOS Boston, MA
GSP Greer, SC
HSE Hatteras, NC
MDT Middletown, PA
MQE East Milton, MA
RIC Richmond, VA

Density altitude <1000 ft, ACE-IDS & WSP interfaces, Part-Time (PT) staff
3 DCPs, met discontinuity and backup sensors, RVR, ACE interface, FT staff
2 DCPs, one DCP with wind sensor only (remote wind), PT staff
Density altitude <1000 ft, **unstaffed**
WSP interface, IFW sensor, PT staff
No present weather (AO1), ACU only, **unstaffed**
ACE-IDS & WSP interfaces, RVR, FT staff

NWS Central Region

2WX Buffalo, SD
ANJ Sault Ste. Marie, MI
CNK Concordia, KS
GFK Grand Forks, ND
GRB Green Bay, WI
MCI Kansas City, MO

No present weather (AO1), SCA configuration, unstaffed
SCA with 9 local sensors, thunderstorm sensor, **unstaffed**
Thunderstorm sensor, FT staff
IFW sensor, FT staff
Observer password corruption, backup ceilometer, PT staff
2 DCPS, backup, RVR, FT staff

NWS Southern Region

AAF Apalachicola, FL
AFW Ft. Worth, TX
ATT Camp Mabry, TX
BNA Nashville, TN
GDP Guadalupe Pass, TX
GNV Gainesville, FL
LCH Lake Charles, LA

Erroneous precipitation amounts w/AWPAG, **unstaffed**
HTB precip problems, FT staff
SRH recommendation, thunderstorm sensor, **unstaffed**
2 DCPs, backup sensor, RVR, FT staff
SCA w/DCP & OID, **unstaffed**
AWPAG false tips, FT staff
AWPAG false tips, FT staff

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MCO Orlando, FL
MEM Memphis, TN
MLB Melbourne, FL

2 DCPs, backup sensors, three pressure sensors in the DCP, RVR, FT staff
no AWPAG false tips, 3 DCP, met discontinuity, RVR, FT staff
HTB problems (heavy dew?), PT staff

NWS Western Region

CZZ Campo, CA
GEG Spokane, WA
SEA Seattle, WA
SFO San Francisco, CA
TRM Palm Springs, CA

SCA, high temperature location, **unstaffed**
WSP interface, RVR, FT staff
2 DCP, backup, ACE-IDS & WSP, FT staff
3 DCP, Met discontinuity and backup sensors, ACE-IDS interface, IFW sensor, RVR, FT staff
Negative pressure reduction constants, GTA radio, **unstaffed**

NWS Alaska Region

PANC Anchorage, AK
PABR Barrow, AK
PALH Anchorage, AK
PATO Portage Glacier, AK

Latitude >60 degrees, 2 DCPs, met discontinuity sensor, RVR, FT staff
Latitude >60 degrees, IFW sensor, 2 DCPs, met discontinuity sensor, GTA radio, RVR, FT staff
2 DCPs, one DCP with wind only (remote wind), FT staff
three pressure sensors in the DCP, **unstaffed**

NWS Pacific Region

ITO Hilo, HI
OGG Kahului, HI

ACE-IDS, IFW sensor, PT staff
2 DCP, backup, ACE, PT staff

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SID	Name	Staffing	DCPs	Multiple Sensors	Comms	ZR	TSTM/ ALDARS	GTA/ ATIS	ACE	NGRVR	PROC	WSP	IFW	AWPAG	WIND DIAG
ACY	Atlantic City, NJ	PT	1 DCP	-	DIAL	ZR	-	-	ACE	-	PROC	WSP	-	AWPAG	
BOS	Boston, MA	FT	3 DCP	M/B	ADAS	ZR	-	DATIS	ACE	NGRVR	PROC	-	-	AWPAG	
GSP	Greer, SC	PT	2 DCP	remote wind	ADAS	ZR	-	ATIS	-	-	PROC	-	-	-	DIAG
HSE	Hatteras, NC	-	1 DCP	-	DIAL	ZR	-	-	-	-	PROC	-	-	AWPAG	
MDT	Middletown, PA	PT	1 DCP	-	ADAS	ZR	ALDARS	ATIS	-	-	PROC	WSP		-	
MQE	Milton, MA	-	ACU	-	DIAL	-	-	-	-	-	PROC	-	-	AWPAG	
RIC	Richmond, VA	FT	1 DCP	-	ADAS	ZR	ALDARS	ATIS	ACE	RVR	PROC	-	-	-	
2WX	Buffalo, SD	-	ACU only	-	DIAL	-	-	-	-	-	PROC	-	-	AWPAG	
ANJ	Sault Ste. Marie, MI	-	SCA	-	DIAL	ZR	TSTM	-	-	-	PROC	-	-	AWPAG	
CNK	Concordia, KS	FT	1 DCP	-	DIAL	-	TSTM	-	-	-	PROC	-	-	AWPAG	
GFK	Grand Forks, ND	FT	1 DCP		ADAS	ZR	ALDARS	ATIS	-	-	PROC	-	IFW	AWPAG	
GRB	Green Bay, WI	PT	1 DCP	B	ADAS	ZR	ALDARS	ATIS	-	-	PROC	-	-	AWPAG	
MCI	Kansas City, MO	FT	2 DCP	B	ADAS	-	ALDARS	ATIS	-	RVR	PROC	-	-	AWPAG	

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SID	Name	Staffing	DCPs	Multiple Sensors	Comms	ZR	TSTM/ ALDARS	GIA/ ATIS	ACE	NGRVR	PROC	WSP	IFW	AWPAG	WIND DIAG
AAF	Apalachicola, FL	-	1 DCP	-	DIAL	-	-	GTA	-	-	PROC	-	-	AWPAG	
AFW	Ft. Worth, TX	FT	1 DCP	-	ADAS	-	ALDARS	-	-	-	PROC	-	-	-	
ATI	Camp Mabry, TX	-	1 DCP	-	DIAL	ZR	TSTM	-	-	-	PROC	-	-	AWPAG	
BNA	Nashville, TN	FT	2 DCP	B	DIAL	ZR	-	-	-	RVR	PROC	-	-	AWPAG	
GDP	Guadalupe Pass, TX	-	SCA w/DCP& OID	-	DIAL	ZR	-	-	-	-	PROC	-	-	AWPAG	
GNV	Gainesville, FL	FT	1 DCP	-	ADAS	-	ALDARS	-	-	-	PROC	-	-	AWPAG	
LCH	Lake Charles, LA	FT	1 DCP	-	ADAS	-	-	ATIS	-	-	PROC	-	-	AWPAG	
MCO	Orlando, FL	FT	2 DCP	B	DIAL	-	-	-	-	RVR	-	-	-	-	
MEM	Memphis, TN	FT	3 DCP	M	ADAS	ZR	ALDARS	ATIS	-	NGRVR	PROC	-	-	AWPAG	
MLB	Melbourne, FL	PT	1 DCP	-	ADAS	-	ALDARS	-	-	-	PROC	-	-	-	
CZZ	Campo, CA	-	SCA	-	DIAL	-	-	-	-	-	PROC	-	-	-	
GEG	Spokane, WA	FT	1 DCP	-	HW	ZR	-	-	-	NGRVR	PROC	WSP		AWPAG	
SEA	Seattle, WA	FT	2 DCP	B	DIAL	ZR	-	ATIS	ACE	NGRVR	-	WSP	-	-	
SFO	San Francisco, CA	FT	3 DCP	M/B	DIAL	-	-	DATIS	ACE	NGRVR	PROC		IFW	AWPAG	
TRM	Pam Springs, CA	-	1 DCP	-	ADAS	-	-	GTA	-	-	PROC	-	-	-	
PANC	Anchorage, AK	FT	2 DCP	M	ADAS	ZR	-	ATIS	-	NGRVR	PROC	-	-	AWPAG	
PABR	Barrow, AK	FT	2 DCP	M	ADAS	ZR	-	GTA	-	NGRVR	PROC		IFW	AWPAG	
PALH	Anchorage, AK	FT	2 DCP	WIND ONLY DCP	ADAS	-	ALDARS	-	-	-	PROC	-	-	-	

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SID	Name	Staffing	DCPs	Multiple Sensors	Comms	ZR	TSTM/ ALDARS	GTA/ ATIS	ACE	NGRVR	PROC	WSP	IFW	AWPAG	WIND DIAG
PATO	Portage Glacier, AK	-	1 DCP	-	ADAS	ZR	-	-	GTA	-	-	-	-	-	-
PHTO	Hilo, HI	PT	1 DCP	-	ADAS	-	-	ATIS	ACE	-		-	IFW	-	
OGG	Kahului, HI	PT	2 DCP	B	ADAS	-	-	-	ACE	-	PROC	-	-	AWPAG	

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Attachment 2

WSH and Field personnel Contacts

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WSH Contacts

Bryan Moore	Test and Evaluation Branch	301-713-0326 x176
Greg Dalyai	Maintenance Branch	301-713-1833 x147
Tony Leonardo	Maintenance Branch	301-713-1833 x120

FAA Contacts

Cal Smith	Terminal Services	202-385-8754
Bing Huang	Terminal Services	202-385-8579

Regional ASOS Focal Points

Eastern Region	Hector Machado	631-244-0145
Southern Region	Martin Garcia	817-978-7777 x137
Central Region	Bob Brashears	816-891-7734 x443
Western Region	Gerald Deiotte	801-524-5120 x262
Alaska Region	Jim Hunter	907-271-5124
Pacific Region	Alan Lowe	808-532-6429

OAT Site Focal Points

Eastern Region

ACY	Atlantic City, NJ	Roy Miller (at PHI)	609-261-6602
BOS	Boston, MA	Alan Dunham (at TAN)	508-823-1900
GSP	Greer, SC	Terry Benthall	864-848-9970 x225
HSE	Hatteras, NC	Geary Wills (at MHX)	252-223-5122
MDT	Middletown, PA	David Foose (at CTP)	814-234-9412
MQE	East Milton, MA	Alan Dunham (at TAN)	508-823-1900
RIC	Richmond, VA	Fay Crossley (at AKQ)	757-899-4200

Central Region

2WX	Buffalo, SD	Paul Michael (at RAP)	605-341-9271 x372
ANJ	Sault Ste. Marie, MI	Robert Weaver (at APX)	989-731-1194 x372
CNK	Concordia, KS	Doug McHatton (at TOP)	785-232-1493 x372
GFK	Grand Forks, ND	Mike Lukasz	701-772-0693
GRB	Green Bay, WI	Rob Hoag	920-494-5845 x381
MCI	Kansas City, MO	John Tatum (at EAX)	816-540-5147 x372

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Southern Region

AAF	Apalachicola, FL	Mike Vise (at TLH)	850-942-8832
AFW	Ft. Worth, TX	Gerry Shultz (at FWD)	817-429-2631
ATT	Camp Mabry, TX	Bill Runyon (at EWX)	830-629-0130 x210
BNA	Nashville, TN	Ralph Troutman	615-754-4633
GDP	Guadalupe Pass, TX	Eddie Brite (at MAF)	432-563-5901
GNV	Gainesville, FL	Mike McAllister (at JAX)	904-741-4370
LCH	Lake Charles, LA	Rick Gravitt	337-477-5285
MCO	Orlando, FL	Dave Jacobs (at MLB)	321-255-0212
MEM	Memphis, TN	Zwemer Ingram	901-544-0353
MLB	Melbourne, FL	Dave Jacobs (at MLB)	321-255-0212

Western Region

CZZ	Campo, CA	Mike Lauderdale (at SGX)	858-675-8704
GEG	Spokane, WA	Dwight Williams	509-244-0110
SEA	Seattle, WA	Bill Flieder	503-326-2340
SFO	San Francisco, CA	Wayne Bailey (at MTR)	831-656-1710
TRM	Palm Springs, CA	Mike Lauderdale (at SGX)	858-675-8704

Alaska Region

PANC	Anchorage, AK	Dan C. Peterson	907-266-5105
PABR	Barrow, AK	Dave Anderson	907-852-6484
PALH	Anchorage, AK	Dan C. Peterson	907-266-5105
PATO	Portage Glacier, AK	Dan C. Peterson (at PANC)	907-266-5105

Pacific Region

ITO	Hilo, HI	Stephen Butler	808-933-6941
OGG	Kahului, HI	Bob Watanabe	808-877-6825

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Attachment 3

Test Trouble Report (TTR) Form

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ASOS TROUBLE REPORT

TYPE/NO _____ LOCATION (SID)

TROUBLE REPORT TITLE

DATE/TIME DISCOVERED _____ ORIGINATOR

AFFECTED SUBSYSTEM _____ S/W VER V2.82
(01/17/06)

A. DESCRIPTION AND CAUSE OF PROBLEM:

B. MAINTENANCE CONSULTED?

___ YES ___ NO (WHY?)

C. PROBLEM NOTED ELSEWHERE?

___ YES (WHERE?) ___ NO

D. TECHNICAL DATA ATTACHED?

___ YES ___ PAGES

___ NO

APPROVED _____ DATE

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